

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

To:

see form PCT/ISA/220

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/IB2004/002476

International filing date (day/month/year)
14.07.2004

Priority date (day/month/year)
05.08.2003

International Patent Classification (IPC) or both national classification and IPC
G06T9/00, H04N7/26

Applicant
KONINKLIJKE PHILIPS ELECTRONICS N.V.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1 (a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/IB2004/002476

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material:
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing:
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/B2004/002476

Box No. II Priority

1. ☒ The following document has not been furnished:
- ☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).
 - ☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).
- Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.
2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-5
	No: Claims	
Inventive step (IS)	Yes: Claims	
	No: Claims	1-5
Industrial applicability (IA)	Yes: Claims	1-5
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Reference is made to the following documents:
D1: BANHAM M R ET AL: "A SELECTIVE UPDATE APPROACH TO MATCHING PURSUITS VIDEO CODING" IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS FOR VIDEO TECHNOLOGY, IEEE INC. NEW YORK, US, vol. 7, no. 1, February 1997 (1997-02), pages 119-129, XP000678885 ISSN: 1051-8215
D2: WO 97/15146 A (BEUKER ROB ANNE ; HEUSDENS RICHARD (NL); PHILIPS ELECTRONICS NV (NL);) 24 April 1997 (1997-04-24)
2. The application does not meet the requirements of Article 6 PCT, because claims 1 and 2 are not clear. The claims read that residual signals are formed from motion compensated "frames", "each" of which is decomposed using matching pursuit algorithm. However, how the residual signals are calculated, whether they are also restricted to blocks or calculated for the whole frame is not mentioned. The claims further state that "other blocks of the current frame" are processed by means of other coding techniques. But what is meant by "other blocks" when "each" of the residual signals are coded by matching pursuit is not made clear. The term "other coding techniques" used in claims 1 and 2 is also unclear and leaves the reader in doubt as to the choice of the techniques and how the decision is taken, thereby rendering the definition of the subject-matter of said claims unclear, Article 6 PCT.
3. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1-5, in so far as presently understood, does not involve an inventive step in the sense of Article 33(3) PCT.
 - 3.1 The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and discloses (the references in parentheses applying to this document), a video coding method where input frames are first divided into blocks, and motion compensated (section 1 lines 1-12; page 121 left col. lines 9-15), then the residual signals are coded by using matching pursuit (MP) algorithm (abs.; page 120 right col. lines 10-27; section 5), later the output stream is generated by coding the atoms and

the motion vectors (section 2.A.5, 2.A.6). In the method proposed by D1 the matching pursuit algorithm is utilized in combination with an orthogonal transform such as DCT to deal more efficiently with the prediction errors of motion compensation. Frames are decided to be coded by MP or by DCT (abs.; section 3; page 126 right col. lines 37-43, lines 51-55; fig. 5-8). This method also suggests dividing the frames into 16 x 16 blocks (section 2.A.1), and limiting the application of atoms only on one block which is found to have the maximum energy and finding the best atom having best match to the signal (section 2.A.2). In addition it is also stated that the basis functions taper to zero at the borders if their 16 x 16 support (page 127 right col. lines 2-5). So an atom acts only on one block.

The difference of the claimed subject-matter over the prior art document is the vague term stating that "other blocks of the current frame being processed by means of other coding techniques". The objective technical problem solved by this feature can therefore be stated as how to provide a more efficient coding method to make better and more granular use of advantages of different coding techniques.

D2 discloses, also in the same technical field, a method of encoding videos in which different coding methods are applied to different regions of the image. The image is first divided into blocks, then the optimal coding method is selected for each block (claim 1; fig. 1, 2; abs.; page 1 lines 1-5, 21-27; page 2 lines 17-26; page 3 lines 4-9; page 5 lines 20-24).

Therefore the person skilled in the art, faced with the said drawback of the prior art document D1 would realise that applying different encoding techniques to different blocks would result in a more efficient method and would find in the D2 disclosure, the respective solution without the exercise of an inventive step. Thus, the subject-matter of independent claim 1 does not involve an inventive step in the sense of Article 33(3) PCT.

- 3.2. The same reasoning applies, *mutatis mutandis*, to the subject-matter of the corresponding apparatus, decoding method, and decoding device independent claims 2, 4, 5, which therefore are also considered not to involve an inventive step in the sense of Article 33(3) PCT.

- 3.3. The additional feature of dependent claim 3, particularly normalization of the expansion coefficient, is found to be obvious if the basis functions do not have unit norm. Thus claim 3 does not meet the requirements of the PCT in respect of inventive step.